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A Hydrogeological Study of the Selkirk Area, Manitoba

CA1 MT 56

72 S08

J. E. Charron

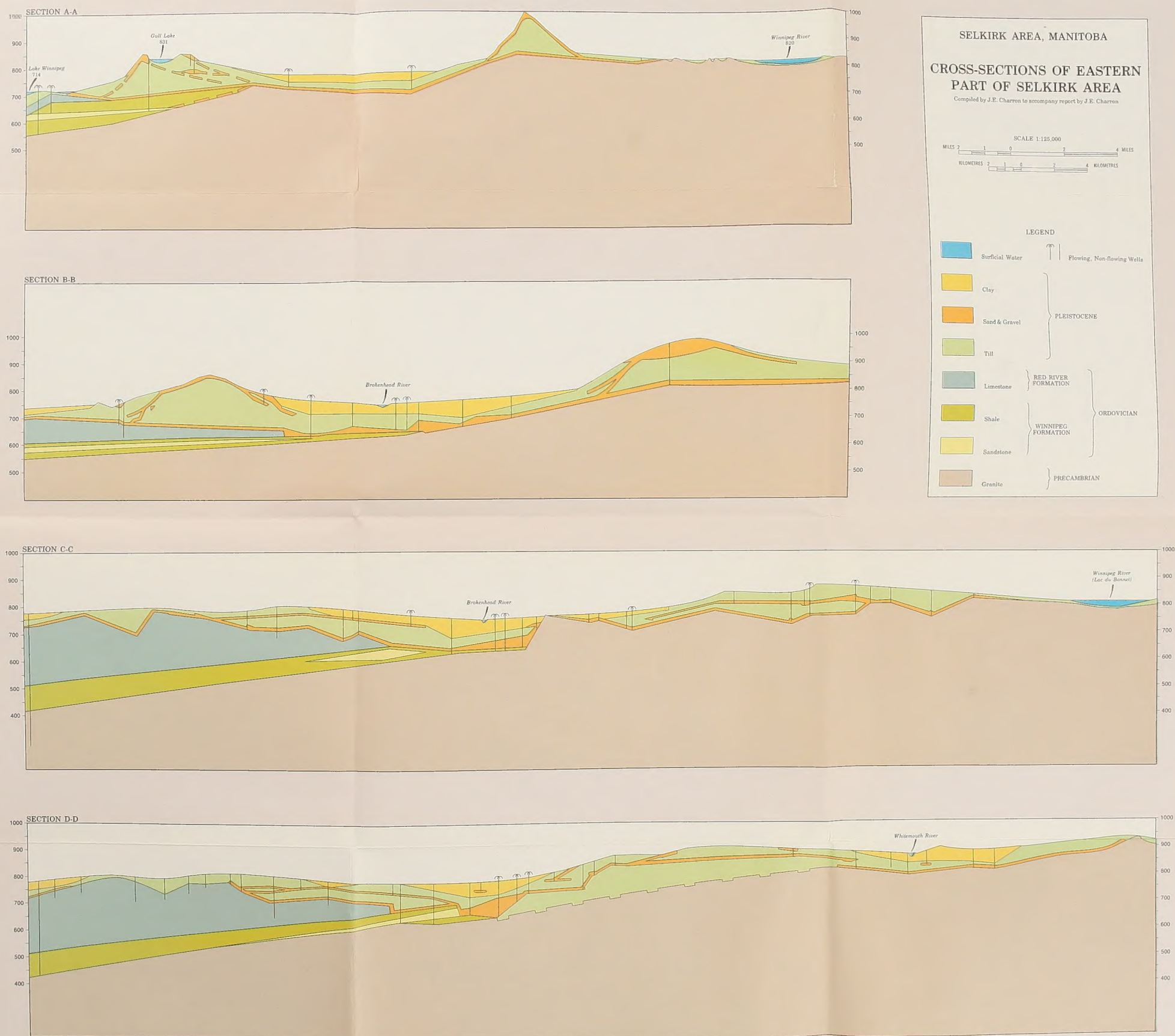
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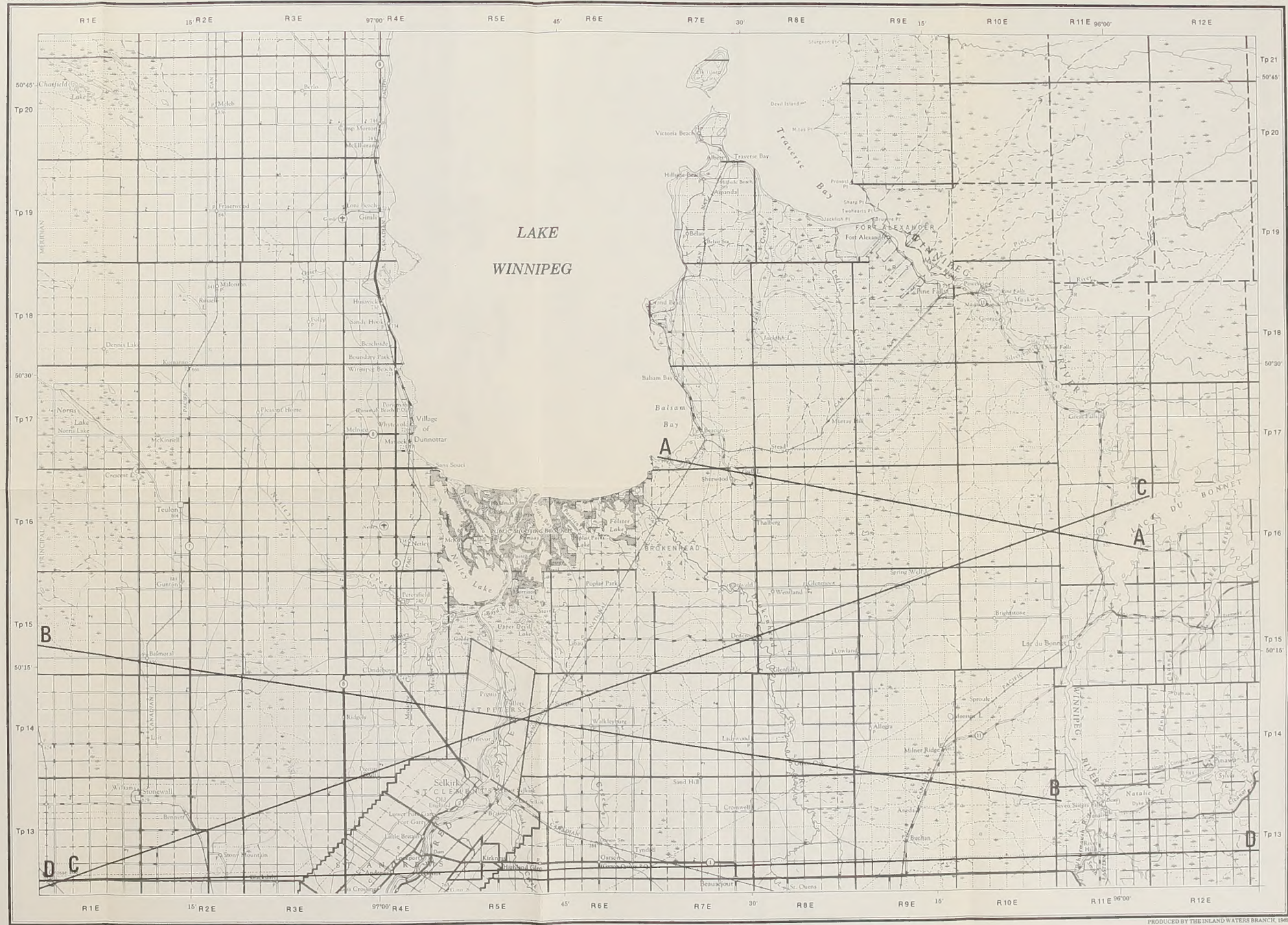
SCIENTIFIC SERIES NO. 8

(Résumé en français)

INLAND WATERS DIRECTORATE,
WATER RESOURCES BRANCH,
OTTAWA, CANADA, 1974.



62-I AND PART OF 52L



Use diagram only to obtain numerical values
APPROXIMATE MEAN DECLINATION 1969
FOR CENTRE OF MAP
Annual change decreasing 2'

Compiled by J.E. Charron
to accompany Report by J.E. Charron

Base map prepared by the Surveys and Mapping Branch
Cartography by the Inland Waters Branch, 1969

INDEX TO SHEETS OF THE NATIONAL TOPOGRAPHIC SYSTEM

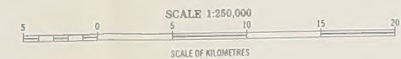
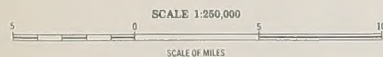


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SELKIRK AREA - MANITOBA

LOCATION OF CROSS-SECTIONS
EASTERN PART OF SELKIRK AREA



CANADA
INLAND WATERS BRANCH
DEPARTMENT OF ENERGY, MINES AND RESOURCES

FIGURE 7

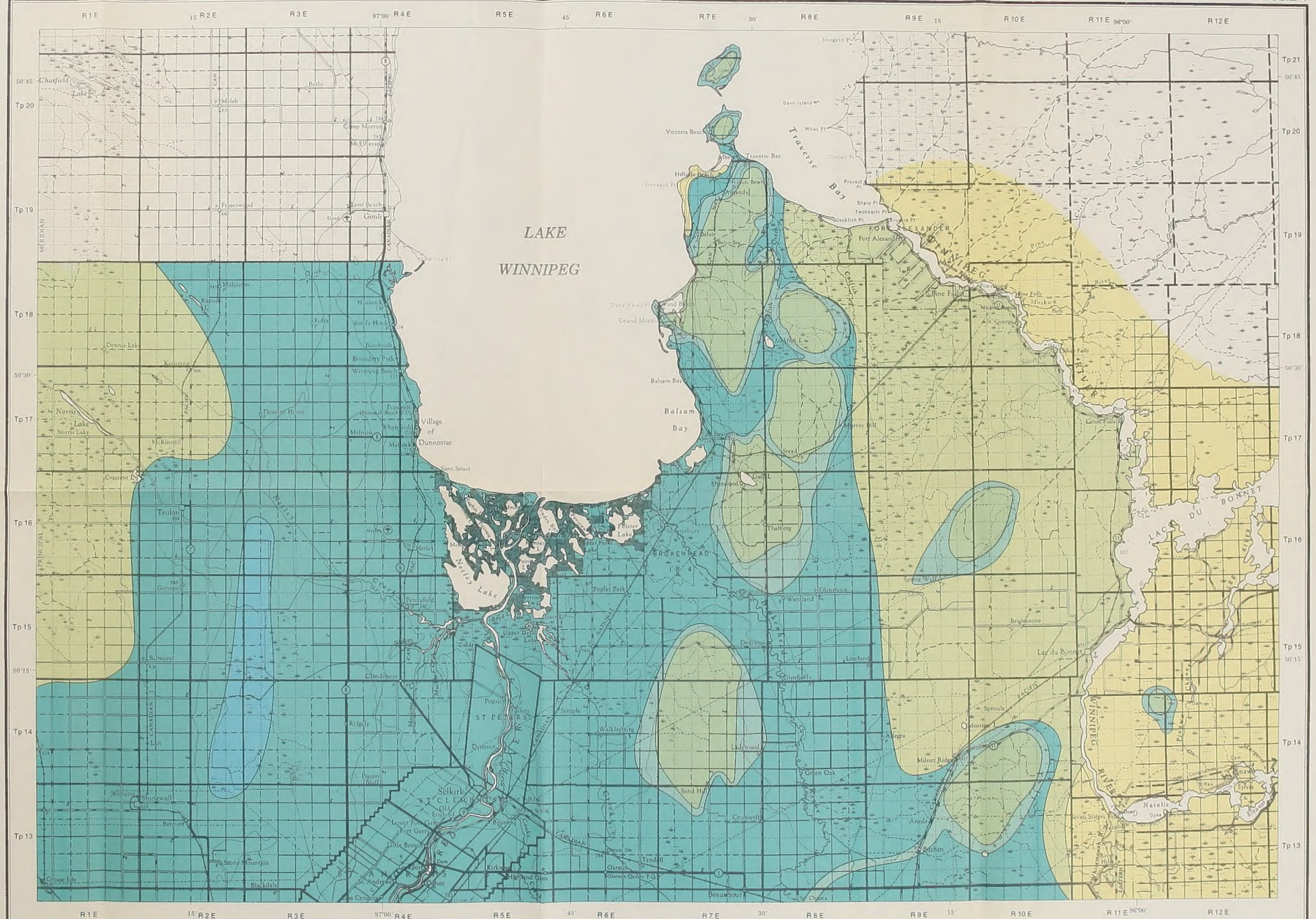
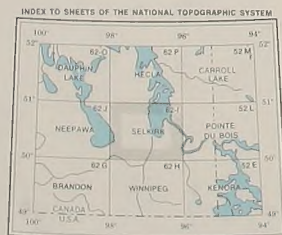
62.1 AND PART OF 52L

LEGEND



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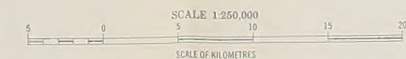
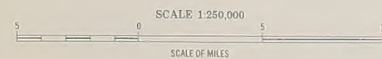
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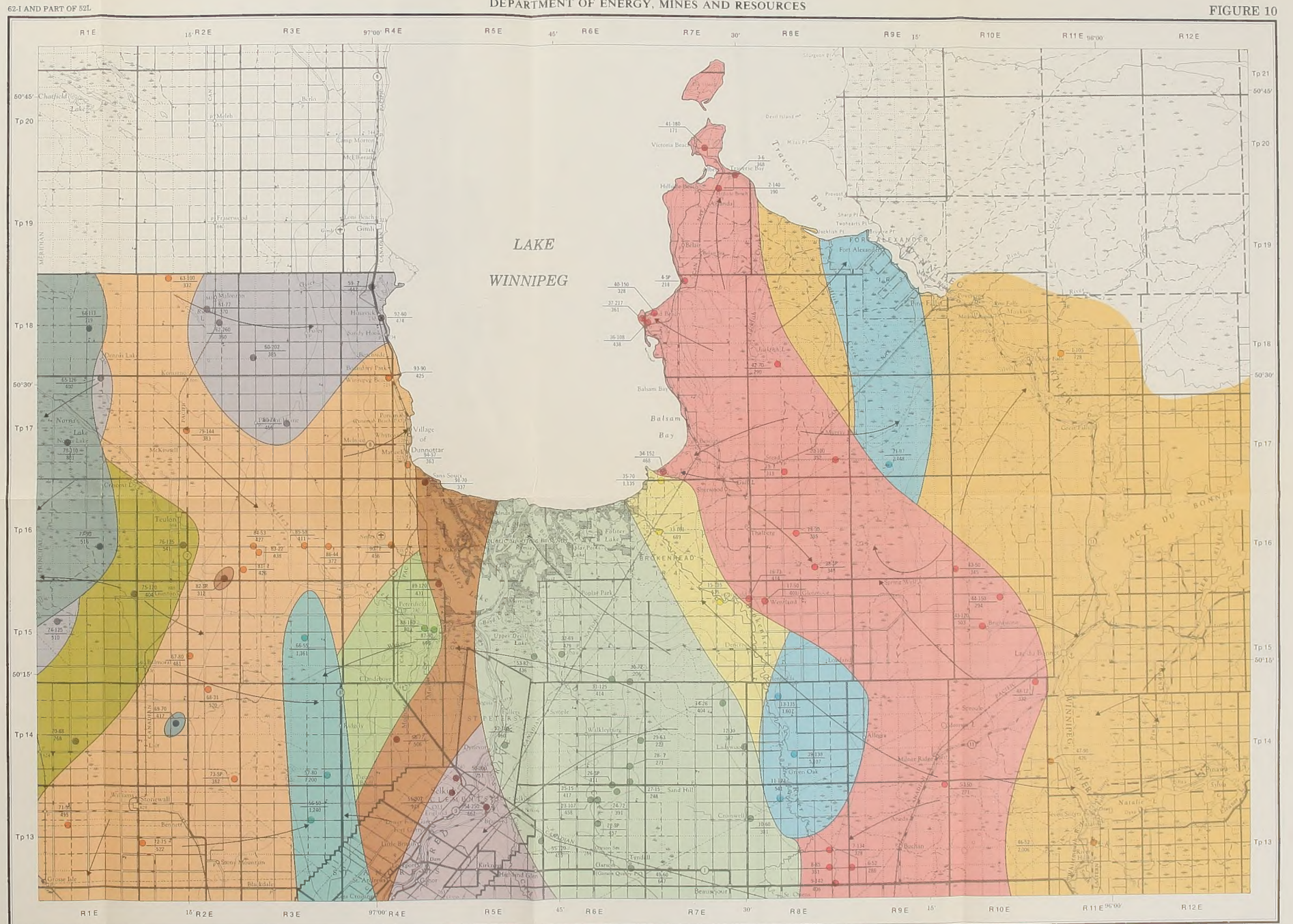
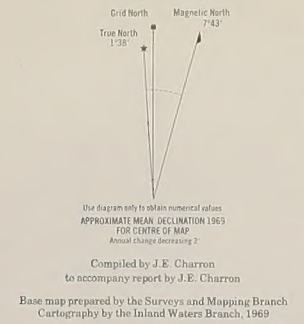
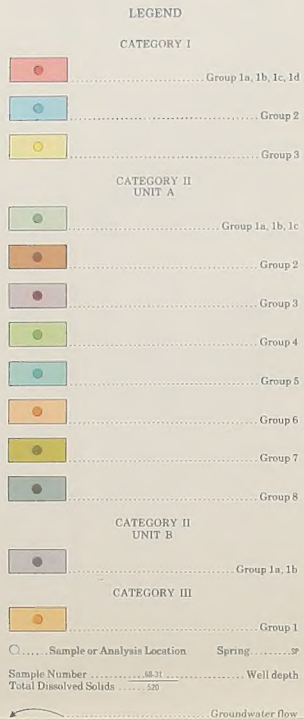
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SELKIRK AREA - MANITOBA GROUNDWATER AVAILABILITY



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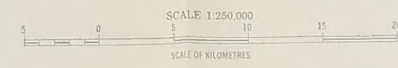
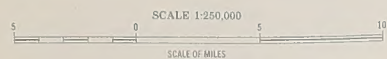
FIGURE 10



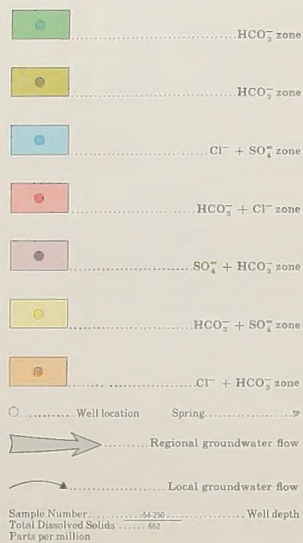
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SELKIRK AREA - MANITOBA
GROUP ZONATION MAP

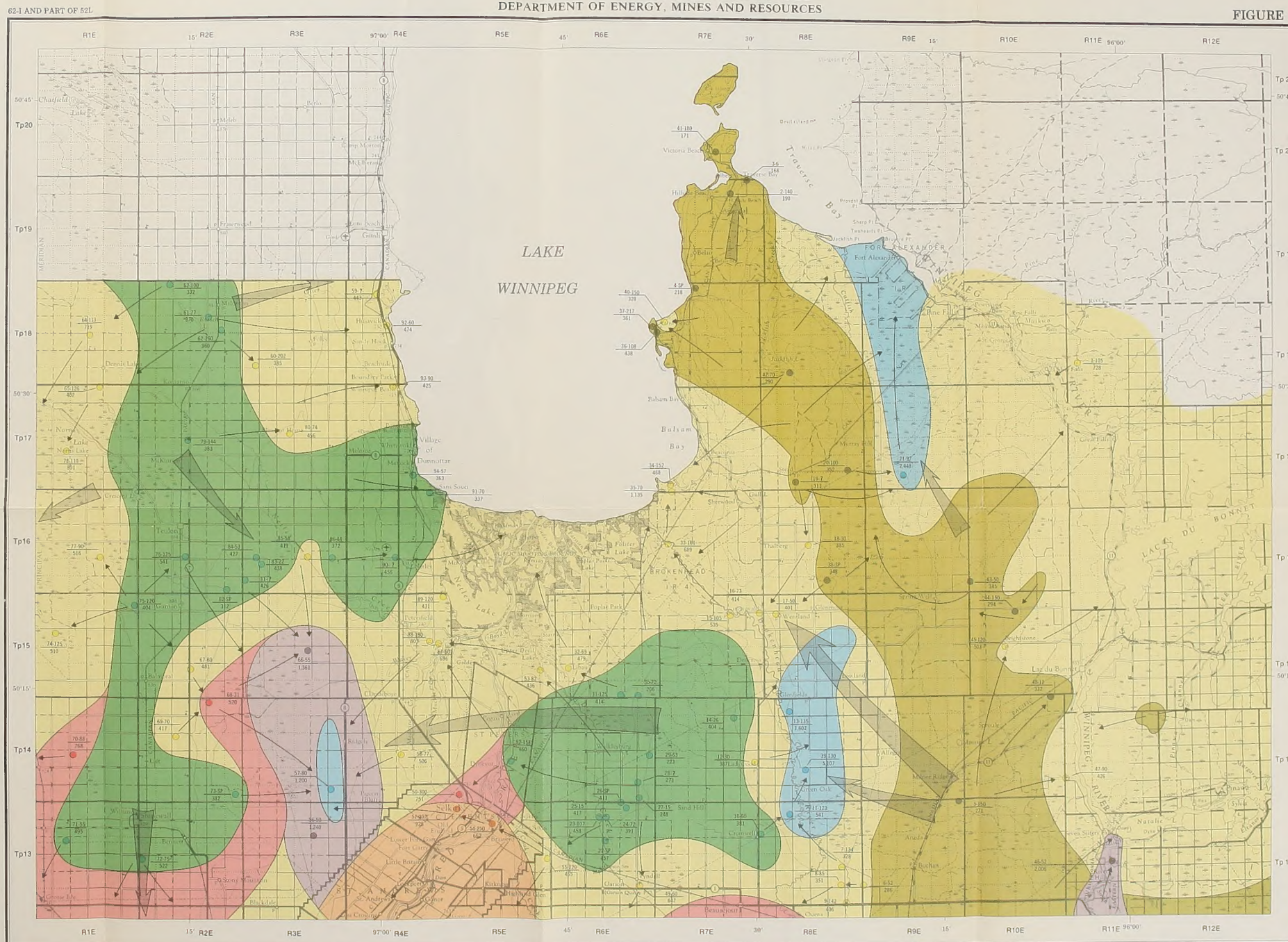
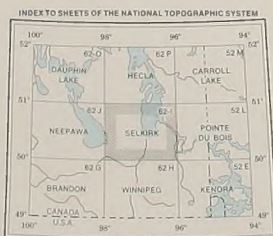


LEGEND



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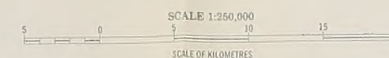
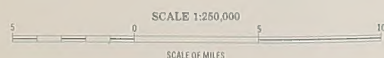
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SELKIRK AREA - MANITOBA
A HYDROCHEMICAL
INTERPRETATION OF DIRECTION
OF GROUNDWATER MOVEMENT



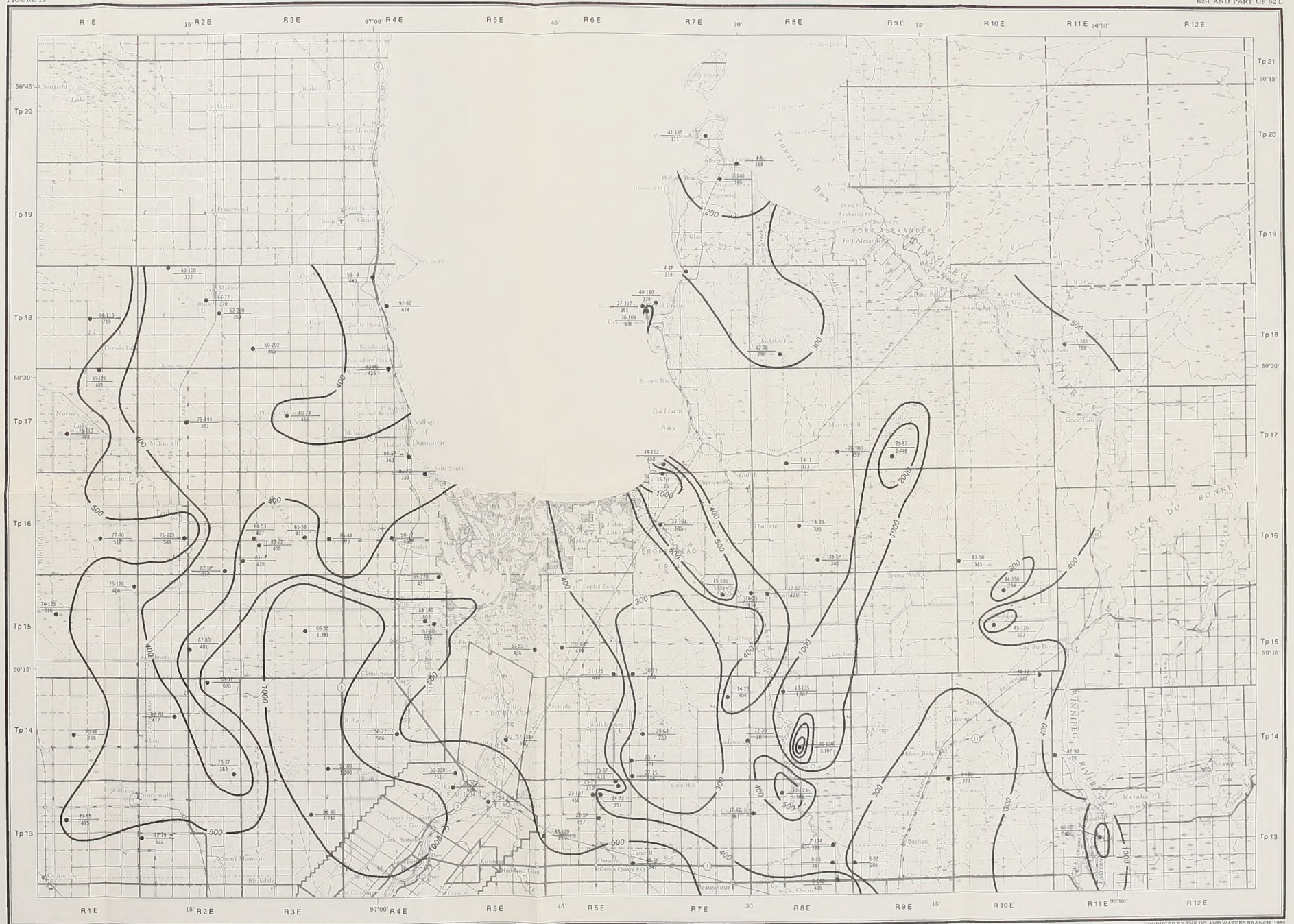
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62-I AND PART OF 52-I

LEGEND

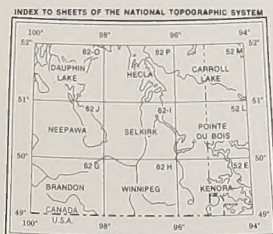


FIGURE 12



Compiled by J.E. Charron
to accompany Report by J.E. Charron

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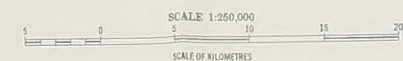
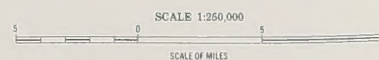


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SELKIRK AREA - MANITOBA

ISOCONS OF TOTAL
DISSOLVED SOLIDS



Sample Number	Group	Chemical Constituents + Ratios in ppm (Equivalents per million)										Total Dissolved Solids of six ions used	Ionic Strength (μ)	$3.618 \sqrt{\mu}$ (ΔpH)	Temperature and Testing (°C)	Correction for Temperature (θ)	pH	$\theta + \Delta pH + pH$ eq. (pH eq. corrected) pH eq. corrected from scale
		Calcium Ca	Magnesium Mg	Sodium Na	Chloride Cl	Sulphate SO_4	Bicarbonate HCO_3	Mg/Cl	Na/Mg	SO_4/Cl	$Cl - Na$ (b.e.l.) Cl	$\sqrt{[Cl]/[SO_4]}$ (S_1)	$\sqrt{[HCO_3]^2/[Cl]}$ (K_1 eq.)	$\sqrt{[Cl]/[HCO_3]}$ (qH eq.)				
CATEGORY I																		
41	1a	2.13	1.17	0.07	0.01	0.14	3.16	0.55	0.06	14.00	− 6.00	0.55	2.77	2.59	6.68	0.005	0.26	23.8
42	"	3.75	1.58	0.15	0.02	0.66	4.80	0.42	0.09	33.00	− 6.50	1.57	4.42	4.24	10.96	0.008	0.33	23.8
44	"	3.50	1.37	0.80	0.02	0.23	5.36	0.39	0.58	11.50	− 39.00	0.90	4.65	4.33	11.80	0.008	0.33	23.9
49	"	4.13	1.64	0.13	0.16	0.64	5.10	0.40	0.08	4.00	+ 0.19	1.62	4.75	4.59	11.28	0.009	0.35	23.8
36	"	4.52	3.25	0.49	0.12	1.10	7.15	0.72	0.15	9.17	− 3.08	2.23	5.27	5.68	16.63	0.013	0.42	23.7
3	1b	2.40	0.52	0.12	0.003	0.30	2.72	0.22	0.23	100.00	− 39.00	0.85	2.61	2.55	6.06	0.005	0.26	23.6
2	"	2.29	0.83	0.32	0.02	0.34	3.11	0.36	0.39	17.00	− 15.00	0.88	2.81	2.67	6.91	0.005	0.26	23.7
4	"	3.08	1.00	0.09	0.001	0.41	3.72	0.32	0.09	410.00	− 89.00	1.12	3.49	3.38	8.30	0.006	0.28	23.9
20	"	2.82	1.85	1.59	0.06	1.25	4.95	0.66	0.86	20.83	− 25.00	1.88	4.10	3.73	12.52	0.009	0.35	24.2
48	"	2.95	2.66	0.74	0.04	0.22	6.13	0.90	0.28	5.50	− 17.50	0.81	4.80	4.25	12.74	0.009	0.35	24.0
38	"	3.23	2.98	0.36	0.03	1.03	5.56	0.92	0.12	34.33	− 11.00	1.82	4.64	4.24	13.19	0.010	0.37	24.1
37	"	3.44	2.66	0.67	0.05	0.83	5.95	0.77	0.25	16.60	− 12.40	1.69	4.96	4.52	13.60	0.010	0.37	23.8
18	"	3.37	3.40	0.50	0.03	1.17	6.11	1.01	0.15	39.00	− 15.67	1.99	5.01	4.54	14.58	0.015	0.45	23.8
5	1b	5.24	1.78	0.24	0.01	0.22	5.00	0.55	0.13	22.00	− 23.00	0.84	5.08	5.12	10.49	0.008	0.33	23.7
43	"	4.05	2.40	1.25	0.01	0.17	6.47	0.59	0.10	17.00	− 24.00	0.83	5.53	5.12	13.55	0.010	0.37	23.9
45	"	3.70	5.07	0.02	0.05	1.15	8.80	1.37	0.20	23.00	− 19.40	2.06	6.59	5.64	19.59	0.020	0.52	24.0
6	1c	1.50	1.54	2.24	0.76	0.30	4.18	1.03	1.45	0.39	− 1.95	0.67	2.97	2.50	10.52	0.007	0.31	23.7
40	"	2.46	1.38	0.07	0.09	0.70	5.28	0.56	1.50	7.78	− 22.00	1.31	4.09	3.60	11.98	0.008	0.33	23.8
7	1c	1.33	0.93	3.24	0.50	1.94	2.95	0.70	3.48	3.88	− 5.48	1.61	2.26	1.98	10.89	0.008	0.33	23.7
8	"	1.55	1.95	2.65	0.21	1.92	3.98	1.26	1.36	9.14	− 11.62	1.73	2.91	2.48	12.26	0.009	0.35	23.9
17	"	1.89	1.55	3.22	0.17	2.94	3.57	0.78	2.08	17.29	− 17.94	2.36	2.89	2.60	13.34	0.010	0.37	23.7
34	"	2.33	1.59	3.91	1.05	2.71	4.16	0.68	2.46	2.58	− 2.72	2.51	3.42	3.11	15.75	0.011	0.39	23.9
16	1c	2.24	2.62	2.37	0.15	2.52	4.80	1.17	0.90	16.80	− 14.80	2.36	3.72	3.38	14.70	0.011	0.39	23.8
9	"	2.19	2.83	2.46	0.44	1.65	5.20	1.29	0.86	3.75	− 4.59	1.90	3.90	3.37	14.77	0.011	0.39	23.6

Sample Number	Group	Chemical Constituents + Ratios in ppm (Equivalents per million)										Total Dissolved Solids of six ions used	Ionic Strength (μ)	$3.618 \sqrt{\mu}$ (ΔpH)	Temperature and Testing (°C)	Correction for Temperature (θ)	pH	$\theta + \Delta pH$ eq. (pH eq. corrected) pH eq. corrected from scale
		Calcium Ca	Magnesium Mg	Sodium Na	Chloride Cl	Sulphate SO_4	Bicarbonate HCO_3	Mg/Cl	Na/Mg	SO_4/Cl	$Cl - Na$ (b.e.l.) Cl	$\sqrt{[Cl]/[SO_4]}$ (S_1)	$\sqrt{[HCO_3]^2/[Cl]}$ (K_1 eq.)	$\sqrt{[Cl]/[HCO_3]}$ (qH eq.)				
11	2	1.28	1.20	6.52	3.13	3.02	2.70	0.94	5.43	0.96	− 1.08	1.97	2.11	1.86	17.85	0.012	0.40	23.6
13	"	7.53	3.37	15.52	17.60	7.62	1.53	0.45	4.61	0.43	+ 0.06	7.57	2.60	3.39	53.17	0.036	0.69	23.7
21	"	8.63	3.64	27.39	23.43	14.32	1.98	0.42	7.52	0.61	+ 0.17	11.12	3.24	4.13	79.39	0.053	0.83	24.4
39	"	25.40	9.54	50.00	61.90	22.11	1.36	0.38	5.24	0.36	+ 0.19	23.70	3.61	5.88	170.31	0.114	1.23	23.8
15	3	0.30	0.25	8.87	0.86	1.31	6.87	0.83	35.48	1.52	− 9.31	0.63	2.42	1.44	18.46	0.010	0.37	23.8
33	"	0.26	0.03	11.65	0.71	2.73	8.05	0.11	388.33	3.85	− 15.41	0.64	2.56	1.45	23.29	0.013	0.42	23.7
35	"	0.27	0.10	17.83	3.21	7.75	6.92	0.37	178.30	2.41	− 4.55	1.45	2.35	1.37	36.08	0.022	0.55	23.9
CATEGORY II, UNIT A																		
30	1a	2.75	1.02	0.11	0.02	0.35	3.47	0.37	0.11	17.50	− 4.50	0.98	3.21	3.09	7.72	0.006	0.28	23.8
29	"	2.88	1.25	0.12	0.03	0.35	3.85	0.43	0.10	11.66	− 3.00	1.00	3.49	3.33	8.48	0.006	0.28	23.7
27	"	2.66	1.79	0.29	0.12	0.44	4.16	0.67	0.16	3.67	− 1.42	1.08	3.58	3.33	9.46	0.007	0.31	24.5
28	"	3.18	1.69	0.32	0.21	0.42	4.56	0.53	0.19	2.00	− 0.52	1.16	4.04	3.81	10.38	0.008	0.33	24.6
12	1b	3.12	3.37	0.74	0.18	1.45	5.69	1.08	0.22	8.06	− 3.11	2.13	4.66	4.21	14.55	0.015	0.45	26.6
10	"	3.29	3.64	0.59	0.33	0.51	6.75	1.11	0.16	1.55	− 0.79	1.30	5.31	4.71	15.11	0.015	0.45	23.6
14	"	3.24	3.47	1.13	0.41	0.49	6.97	1.07	0.33	1.20	− 1.76	1.26	5.40	4.75	15.11	0.015	0.45	24.6
23	"	3.73	4.20	1.07	1.00	0.84	7.18	1.13	0.25	0.84	− 0.07	1.77	5.77	5.18	18.02	0.018	0.49	24.5
24	1c	3.02	4.20	0.59	0.45	0.77	6.57	1.39	0.14	1.71	− 0.31	1.52	5.07	4.45	15.50	0.016	0.47	24.5
26	"	3.78	3.97	0.33	0.19	0.71	6.97	1.05	0.08	3.74	− 0.74	1.64	5.68	5.13	15.95	0.016	0.47	24.5
22	"	4.08	4.39	0.40	0.29	0.88	7.46	1.08	0.09	3.03	− 0.38	1.89	6.10	5.52	17.50	0.018	0.49	24.5
31	1c	2.91	4.84	0.38	0.24	0.89	6.74	1.66	0.08	3.71	− 0.58	1.61	5.09	4.43	16.00	0.016	0.47	23.8
25	"	3.69	4.05	0.41	0.25	0.71	6.97	1.10	0.10	2.84	− 0.64	1.62	5.64	5.07	16.08	0.016	0.47	24.4
32	"	3.59	4.51	1.11	0.54	1.51	7.20	1.26	0.25	2.80	− 1.06	2.33	5.71	5.08	18.46	0.018	0.49	23.7
53	1c	2.46	4.53	1.22	0.76	1.43	6.20	1.84	0.27	1.88	− 0.61	1.88	4.56	3.91	16.60	0.013	0.42	22.5
55	"	3.35	4.74	0.61	0.34	1.02	7.23	1.41	0.13	3.00	− 0.79	1.85	5.59	4.92	17.29	0.013	0.42	22.0
52	"	3.09	5.63	0.45	0.22	0.85	7.93	1.82	0.08	3.86	− 1.05	1.62	5.79	4.95	18.17	0.014	0.44	22.7
49	"	3.80	7.72	0.85	0.80	2.00	9.06	2.03	0.11	25.00	− 0.06	2.76	6.78	5.88	24.23	0.024	0.57	24.2

Sample Number	Group	Chemical Constituents + Ratios in ppm (Equivalents per million)										Total Dissolved Solids of six ions used	Ionic Strength (μ)	$3.618 \sqrt{\mu}$ (ΔpH)	Temperature and Testing (°C)	Correction for Temperature (θ)	pH	$\theta + \Delta pH + pH$ eq. (pH eq. corrected) pH eq. corrected from scale
		Calcium Ca	Magnesium Mg	Sodium Na	Chloride Cl	Sulphate SO_4	Bicarbonate HCO_3	Mg/Cl	Na/Mg	SO_4/Cl	$Cl - Na$ (b.e.l.) Cl	$\sqrt{[Cl]/[SO_4]}$ (S_1)	$\sqrt{[HCO_3]^2/[Cl]}$ (K_1 eq.)	$\sqrt{[Cl]/[HCO_3]}$ (qH eq.)				
82	1	0.50	4.75	0.74	0.34	0.66	5.22	9.50	0.16	1.94	− 1.18	0.57	2.39	1.62	12.21	0.009	0.35	22.7
91	"	0.65	5.30	0.83	0.34	0.81	5.68	8.15	0.16	2.38	− 1.44	0.73	2.76	1.92	13.61	0.010	0.37	22.7
89	"	0.96	6.25	1.26	0.45	1.47	6.71	6.51	0.20	3.27	− 1.80	1.19	3.51	2.54	17.00	0.013	0.42	22.6
58	"	0.93	7.34	1.96	0.73	1.13	8.38	7.89	0.27	1.55	− 1.68	1.03	4.03	2.79	20.47	0.015	0.45	22.3
54	3	0.85	4.92	5.65	3.84	2.85	5.24	5.79	1.15	0.74	− 0.47	1.56	2.86	2.11	23.35	0.016	0.47	22.4
50	"	0.49	7.98	4.78	4.06	3.75	5.98	16.29	0.60	0.92	− 0.18	1.36	2.62	1.71	27.04	0.020	0.52	22.7
51	"	1.18	7.24	7.83	7.16	3.58	6.05	6.14	1.08	0.50	− 0.09	2.06	3.51	2.67	33.04	0.023	0.56	22.7
87	4	2.36	8.39	3.35	1.64	4.56	7.65	3.56	0.40	2.58	− 1.04	3.28	5.17	4.25	27.95	0.022	0.55	22.6
88	"	2.62	8.55	3.87	1.92	4.81	7.85	3.26	0.45	2.51	− 1.02	3.25	5.45	4.54	29.62	0.023	0.56	22.5
57	5	4.84	8.13	7.48	7.90	6.85	6.15	1.68	0.92	0.87	+ 0.05	5.76	5.68	4.63	41.35	0.031	0.64	2

Table 6—Chemical Analyses of Groundwater in the Selkirk Area, Manitoba

Analyzed by Inland Waters Branch, Water Quality Division,
Department of Energy, Mines and Resources

Sample No.	Location	Depth of Well (ft.)	Temperature (°C)	Colour (Hazan Unit)	pH	Carbon Dioxide (CO ₂)	Conductance (Microhmoh at 25°C)	CHEMICAL CONSTITUENTS IN PARTS PER MILLION																
								HARDNESS			Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Iron (Fe)	Bicarbonate (HCO ₃)	Sulphate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Silica (SiO ₂)	Sum of Constituents	% of Sodium	S A R
								Non-Carbonate	Total	Total Alkalinity as CaCO ₃														
1	NW-17-18-11E	112	6.1	10	8.1	6	1,123	81.0	458	377	86.7	58.7	85.0	5.3	0.05	460	216.0	33.6	0.86	0.6	15	728	28	1.73
2	SW-35-19-7E	140	5.0	5	8.1	2	330	0.0	156	156	45.9	10.1	7.4	2.8	0.23	190	16.3	0.7	0.18	0.2	13	190	9	0.26
3	SW-1-20-7E	SP	5.6	10	8.1	2	286	10.0	146	136	48.1	6.3	2.8	1.6	0.27	166	32.2	0.1	0.14	0.2	13	168	4	0.10
4	NW-33-18-7E	SP	5.6	5	7.9	5	376	18.0	204	186	61.8	12.1	2.0	1.7	0.15	227	19.5	0.1	0.09	0.3	9	218	2	0.06
5	NE-36-13-9E	151	5.6	5	7.8	5	466	1.0	251	250	64.9	21.6	5.5	2.1	1.40	305	10.4	0.2	0.16	0.4	16	271	5	0.15
6	SW-7-13-9E	52	6.1	5	8.0	4	498	0.0	152	209	30.1	18.7	51.5	4.1	0.41	255	14.2	27.1	0.66	2.2	12	286	42	1.82
7	SE-14-13-8E	134	7.2	5	7.7	6	523	0.0	113	148	26.6	11.3	74.5	3.6	0.35	180	93.0	17.8	1.14	0.2	11	328	58	3.05
8	SE-11-13-8E	85	6.1	10	8.1	3	571	0.0	175	199	31.0	23.7	61.0	3.1	0.44	243	92.2	7.5	0.71	2.5	10	351	43	2.01
9	SW-1-13-8E	142	6.1	10	8.0	5	674	0.0	251	260	43.8	34.4	36.5	3.1	1.20	317	79.1	15.5	0.58	2.6	14	406	33	1.55
10	SW-30-13-8E	60	6.1	10	7.9	8	660	9.0	347	338	66.0	44.3	13.5	3.6	1.08	412	24.4	11.8	0.23	0.3	14	381	8	0.32
11	SE-32-13-8E	123	6.1	10	7.7	8	923	0.0	124	135	25.6	14.6	150.0	4.5	0.15	165	145.0	111.0	0.92	0.4	8	541	72	5.87
12	SE-13-14-7E	30	6.1	10	7.9	7	647	4.0	325	285	62.6	41.0	17.0	4.2	1.61	347	69.5	6.5	0.25	0.2	15	387	10	0.41
13	SE-32-14-8E	135	6.1	10	6.9	18	2,702	469.0	546	77	151.0	41.0	357.0	9.5	0.08	94	366.0	624.0	0.90	2.2	9	1,607	58	6.65
14	NE-26-14-7E	26	6.1	10	7.9	8	699	0.0	336	349	65.0	42.2	26.0	4.3	0.74	425	23.7	14.6	0.27	1.1	17	404	14	0.62
15	NW-26-15-7E	105	6.1	10	7.9	8	872	0.0	27	344	6.1	3.0	204.0	3.5	0.12	419	3.0	30.4	5.40	0.3	13	535	93	16.90
16	NW-25-15-7E	73	5.6	10	7.8	7	661	3.0	243	240	44.9	31.8	54.5	3.7	0.20	293	121.0	5.4	0.45	1.3	7	414	32	1.52
17	NW-30-15-8E	50	5.0	10	7.8	5	630	0.0	172	179	37.8	18.9	74.0	2.9	0.17	218	141.0	6.0	0.07	1.5	11	401	48	2.46
18	NW-16-16-8E	20	5.0	10	7.8	9	642	33.0	339	306	67.5	41.4	11.5	4.6	1.25	373	56.1	0.9	0.32	0.2	19	385	7	0.27
19	SW-4-17-8E	—	6.1	10	7.5	15	330	34.0	285	82.7	20.0	3.0	2.8	2.37	311	30.7	5.8	0.20	0.2	15	313	2	0.08	
20	SW-12-17-8E	100	6.1	10	7.8	8	561	0.0	234	248	56.6	22.5	36.5	3.8	0.92	302	59.8	2.2	0.30	1.1	20	352	25	1.08
21	NW-4-17-9E	97	5.0	10	7.2	18	3,959	515.0	614	99	173.0	44.2	630.0	8.8	0.17	121	688.0	831.0	0.46	0.4	13	2,448	69	11.10
22	NW-22-13-6E	SP	4.4	10	7.7	14	774	51.0	424	373	81.8	53.4	9.2	4.0	0.50	455	42.3	10.4	0.27	18.6	13	457	5	0.19
23	SE-6-17-7E	107	6.1	10	7.8	11	795	38.0	397	359	74.7	51.1	24.5	3.9	0.03	438	40.5	35.3	0.25	0.7	12	458	12	0.54
24	SW-13-14-6E	72	5.0	10	8.0	10	685	32.0	361	329	60.5	51.0	13.5	3.7	0.08	401	32.0	16.0	0.34	0.4	11	391	7	0.31
25	NW-35-13-4E	SP	5.6	10	7.6	16	712	38.0	387	349	73.9	49.2	9.5	3.1	0.08	425	34.0	9.0	0.31	15.5	13	417	5	0.21
26	NW-35-13-4E	SP	5.6	10	7.9	8	705	39.0	388	349	75.8	48.3	7.5	3.1	0.74	425	34.0	6.7	0.03	13.0	13	411	4	0.17
27	SW-1-14-6E	12	5.0	10	8.1	3	430	15.0	223	208	53.4	21.8	6.7	2.5	0.78	254	21.1	4.2	0.04	0.3	13	248	6	0.20
28	SW-12-14-6E	—	5.0	10	8.0	4	470	16.0	244	228	63.7	20.6	7.4	2.4	0.77	278	20.0	7.4	0.03	0.2	12	271	6	0.21
29	NE-13-14-6E	63	5.6	10	8.1	3	377	14.0	207	193	57.8	15.2	2.8	2.1	1.58	235	16.7	0.9	0.00	0.2	11	223	3	0.08

Table 6—Chemical Analyses of Groundwater in the Selkirk Area, Manitoba (Cont'd)

Analyzed by Inland Waters Branch, Water Quality Division,
Department of Energy, Mines and Resources

Sample No.	Location	Depth of Well (ft.)	Temperature (°C)	Colour (Hazan Unit)	pH	Carbon Dioxide (CO ₂)	Conductance (Microhmhos at 25° C)	CHEMICAL CONSTITUENTS IN PARTS PER MILLION																
								HARDNESS			Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Iron (Fe)	Bicarbonate (HCO ₃)	Sulphate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Silica (SiO ₂)	Sum of Constituents	% of Sodium	S A R
								Non-Carbonate	Total	Total Alkalinity as CaCO ₃														
30	SE-2-15-6E	72	5.0	10	7.9	4	360	15.0	189	174	55.2	12.4	2.6	1.9	0.33	212	17.0	0.8	0.00	0.1	12	206	3	0.08
31	SE-13-15-6E	125	5.6	10	8.0	6	688	50.0	387	337	58.3	58.8	8.7	4.5	0.12	411	42.7	8.5	0.16	19.0	11	414	5	0.19
32	NE-7-15-6E	69	5.6	10	7.9	9	806	45.0	405	360	71.9	54.8	25.5	4.8	5.10	439	72.6	19.0	0.10	0.4	14	479	12	0.55
33	NE-18-16-7E	161	5.6	10	8.4	3	1,100	0.0	8	408	2.5	0.4	268.0	7.5	0.04	491	131.0	25.1	4.90	0.5	5	689	97	41.20
34	NE-6-17-7E	150	7.2	5	7.6	10	723	0.0	196	208	46.7	19.3	90.0	7.6	0.41	254	130.0	37.1	4.42	0.3	12	468	49	2.80
35	SE-6-17-7E	83	5.6	5	7.8	10	1,815	0.0	19	346	5.4	1.2	410.0	12.9	0.06	422	372.0	114.0	6.60	0.4	6	1,135	96	41.50
36	SE-24-18-6E	108	8.9	10	7.9	9	714	31.0	389	358	90.6	39.5	11.2	5.0	1.57	436	52.6	4.3	0.14	0.4	19	438	6	0.25
37	SE-24-18-6E	217	7.2	5	7.9	7	600	7.0	305	298	68.9	32.3	15.5	5.5	0.75	363	40.0	1.8	0.23	0.7	17	361	10	0.39
38	FNE-3-16-8E	SP	3.9	5	7.9	7	589	33.0	311	278	64.8	36.2	8.3	4.3	1.53	339	49.6	0.9	0.09	0.4	17	348	5	0.20
39	NE-9-14-8E	100	7.2	5	6.7	25	7,896	1,679.0	1,747	68	509.0	116.0	1,150.0	24.6	0.38	83	1,062.0	2,195.0	0.40	0.4	9	5,107	58	11.90
40	NW-19-18-7E	150	8.3	5	7.9	6	616	0.0	193	264	49.2	16.8	47.5	8.1	0.48	322	33.7	3.3	0.15	0.3	11	328	34	1.49
41	NW-10-20-7E	179	7.2	10	7.7	6	313	7.0	165	158	42.6	14.2	1.5	1.1	1.47	193	6.7	0.5	0.00	2.7	7	171	2	0.05
42	NE-5-18-8E	70	7.2	5	7.9	6	493	27.0	267	240	75.2	19.2	3.5	3.4	2.78	293	31.9	0.7	0.15	0.1	12	290	3	0.09
43	NW-6-16-10E	50	6.1	5	7.6	15	588	0.0	323	324	81.2	29.2	5.7	4.0	1.20	395	8.1	0.4	0.30	0.5	21	345	4	0.14
44	NE-28-15-10E	150	7.8	5	8.1	4	491	0.0	244	268	70.1	16.7	18.5	1.6	1.11	327	11.1	0.6	0.25	0.1	14	294	14	0.52
45	NW-16-15-10E	120	5.6	5	8.0	8	833	8.0	439	431	74.1	61.7	23.5	5.8	0.59	525	55.2	1.8	0.33	3.0	19	503	10	0.49
46	SW-22-13-11E	52	6.7	5	7.6	13	2,431	951.0	1,228	277	248.0	148.0	166.0	6.9	0.74	338	1,234.0	14.9	0.44	2.7	19	2,006	23	2.06
47	SW-18-14-11E	90	7.2	5	7.9	6	705	39.0	294	255	64.2	32.5	39.0	4.5	4.55	311	108.0	7.6	0.74	0.7	16	426	22	0.99
48	NW-36-14-10E	12	5.6	5	8.0	6	562	0.0	281	307	59.1	32.4	17.0	4.4	0.71	374	10.4	1.3	0.71	2.4	20	332	11	0.44
49	SW-12-13-6E	60	—	5	8.1	7	1,059	123.0	577	454	76.2	93.9	19.5	7.1	0.08	553	96.2	28.3	0.36	37.0	16	647	7	0.35
50	M.H.Selkirk	300	6.7	3	8.8	1	1,294	125.0	424	299	9.9	97.0	110.0	15.0	0.10	327	180.0	144.0	0.36	3.3	12	751	35	2.30
51	P.D.V.Selkirk	307	18.3	8	8.0	3	1,598	118.0	421	303	23.6	88.0	180.0	12.0	0.369	172.0	250.0	0.32	3.4	13	928	47	3.80	
52	L-203-6E	171	6.1	3	8.0	3	759	79.0	295	44	64.6	68.4	4.0	0.97	4.48	41.0	7.9	0.30	14.0	14	460	5	0.20	
53	NE-12-15-5E	80	8.1	5	8.1	5	740	40.0	350	310	49.3	32.0	28.0	5.3	5.75	378	68.7	27.0	0.15	0.5	45	435	3	0.30
54	FL-77-7E	250	6.7	3	8.7	1	1,158	27.0	289	262	17.1	59.8	130.0	13.0	0.37	301	137.0	136.0	0.28	0.5	11	662	48	3.00
55	NE-12-13-5E	120	6.1	3	8.1	6	780	43.0	405	362	67.2	57.6	14.0	4.3	0.03	441	49.0	12.0	0.24	20.0	13	455	7	0.30
56	SE-26-13-3E	50	5.6	3	8.0	8	2,067	341.0	739	398	124.0	104.0	150.0	11.0	0.99	485	483.0	115.0	0.20	0.1	13	1,240	2	0.40
57	NW-1-14-3E	80	9.4	3	7.8	10	2,000	341.0	649	308	96.9	98.9	172.0	11.0	4.43	375	329.0	280.0	0.23	0.4	10	1,200	36	2.90
58	NW-15-14-4E	77	5.6	3	8.4	3	877	0.0	414	419	18.7	89.2	45.0	5.2	0.19	490	54.5	26.0	0.34	0.1	15	506	19	0.80

LEGEND

ARTIFICIAL DEPOSITS

Permeable Area

Gravel (x gravel pit)

Gravel and Sand

Semi-permeable Area

Till

Silt (ice crack feature)

Impermeable Area

Clay

ROCK OUTCROP

Limestone (quarry)

Limestone and Dolomite (sink hole)

Granite (x quarry)

Grid North

Magnetic North

Grid North 1°38'

Magnetic North 7°43'

Annual change decreasing 2"

Annual change decreasing 2"

Annual change decreasing 2"

Annual change decreasing 2"

Annual change decreasing 2"

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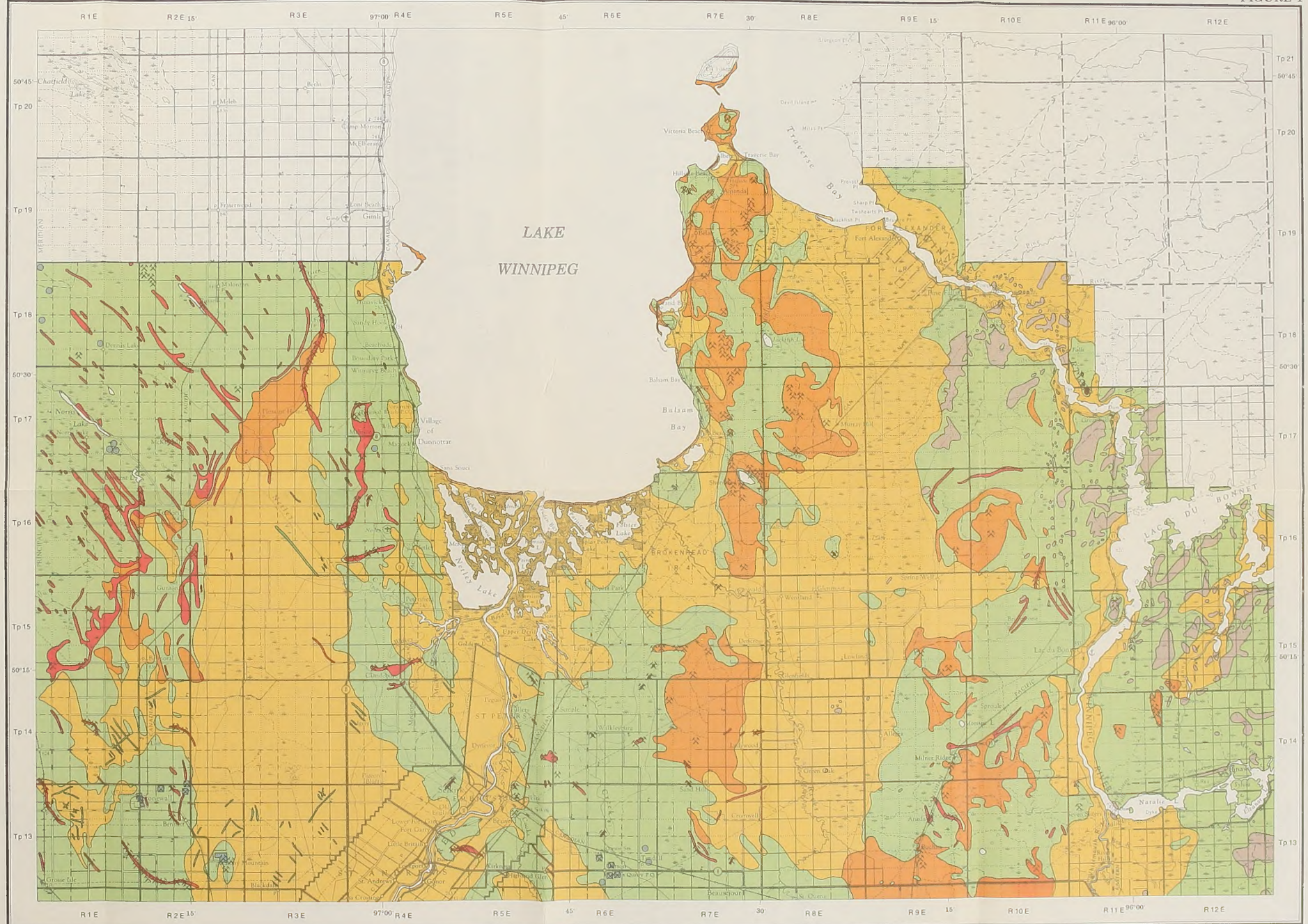
Annual change decreasing 2"

Annual change decreasing 2"

Annual change decreasing 2"

Annual change decreasing 2"

62-1 AND PART OF 52 L



PRINTED BY THE SURVEYS AND MAPPING BRANCH,
DEPARTMENT OF ENERGY, MINES AND RESOURCES

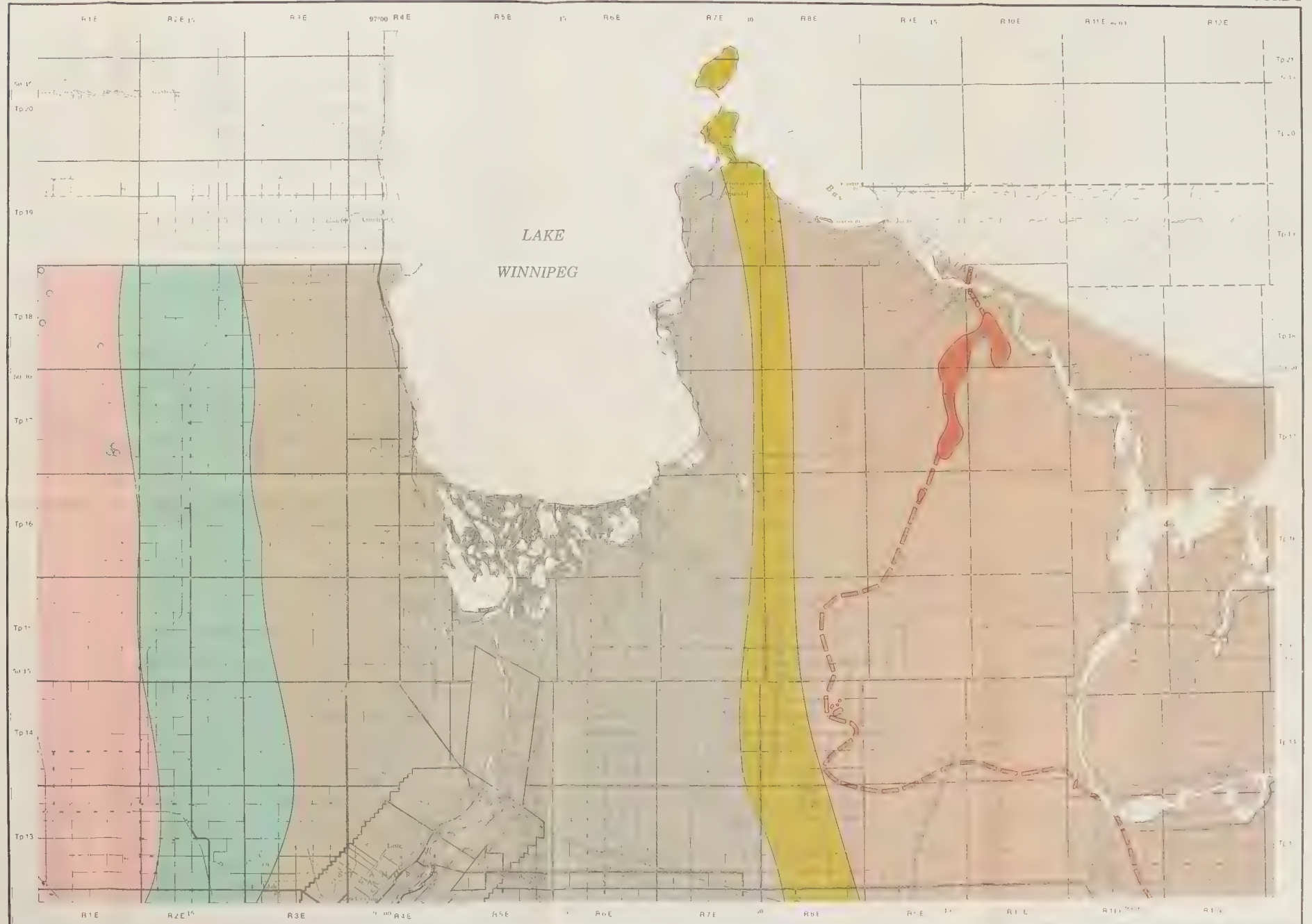
PRODUCED BY THE INLAND WATERS BRANCH, 1969

SELKIRK AREA - MANITOBA
INFILTRATION MAP

SCALE 1:250,000
SCALE OF MILES

SCALE 1:250,000
SCALE OF KILOMETRES

62-I AND PART OF 62-L



SELKIRK AREA - MANITOBA
BEDROCK GEOLOGY MAP

SCALE 1:250,000
SCALE OF MILES

SCALE 1:250,000
SCALE OF KILOMETRES

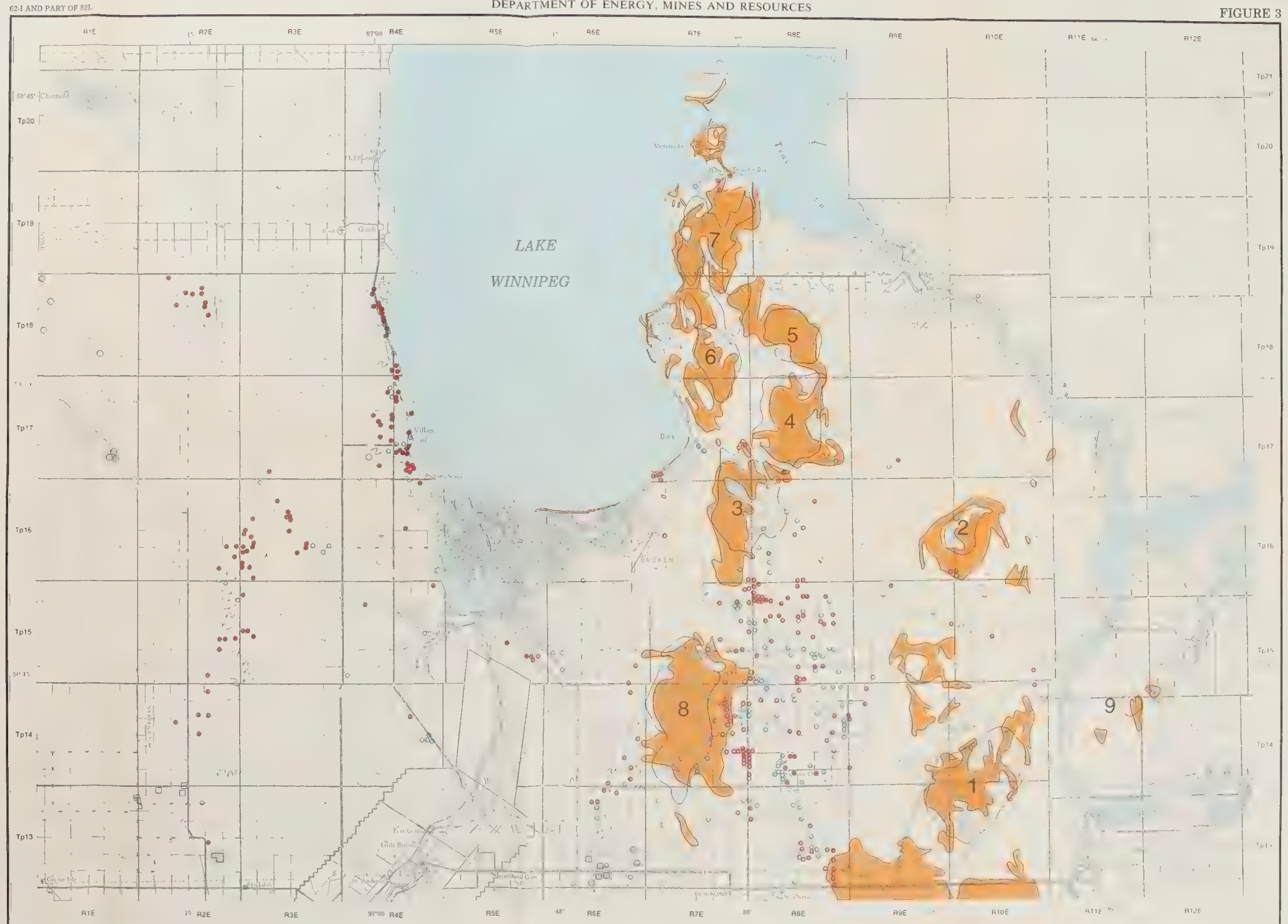
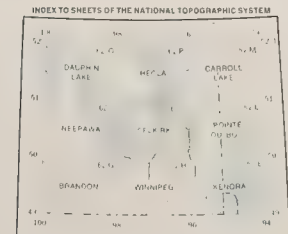
- LEGEND
- Topographical High Points, Number
 - Gravel and Sand Deposit Areas
 - Sink-Holes
 - Flowing Wells
 - Non-flowing Wells
 - Spring

True North
1° 18'

Use of symbols to obtain numerical values
APPROXIMATE MEAN DECLINATION 1959
FOR CENTRE OF MAP
Annual change decreasing 2

Compiled by J.E. Charron
to accompany report by J.E. Charron

Base map prepared by the Surveys and Mapping Branch
Cartography by the Inland Waters Branch, 1969



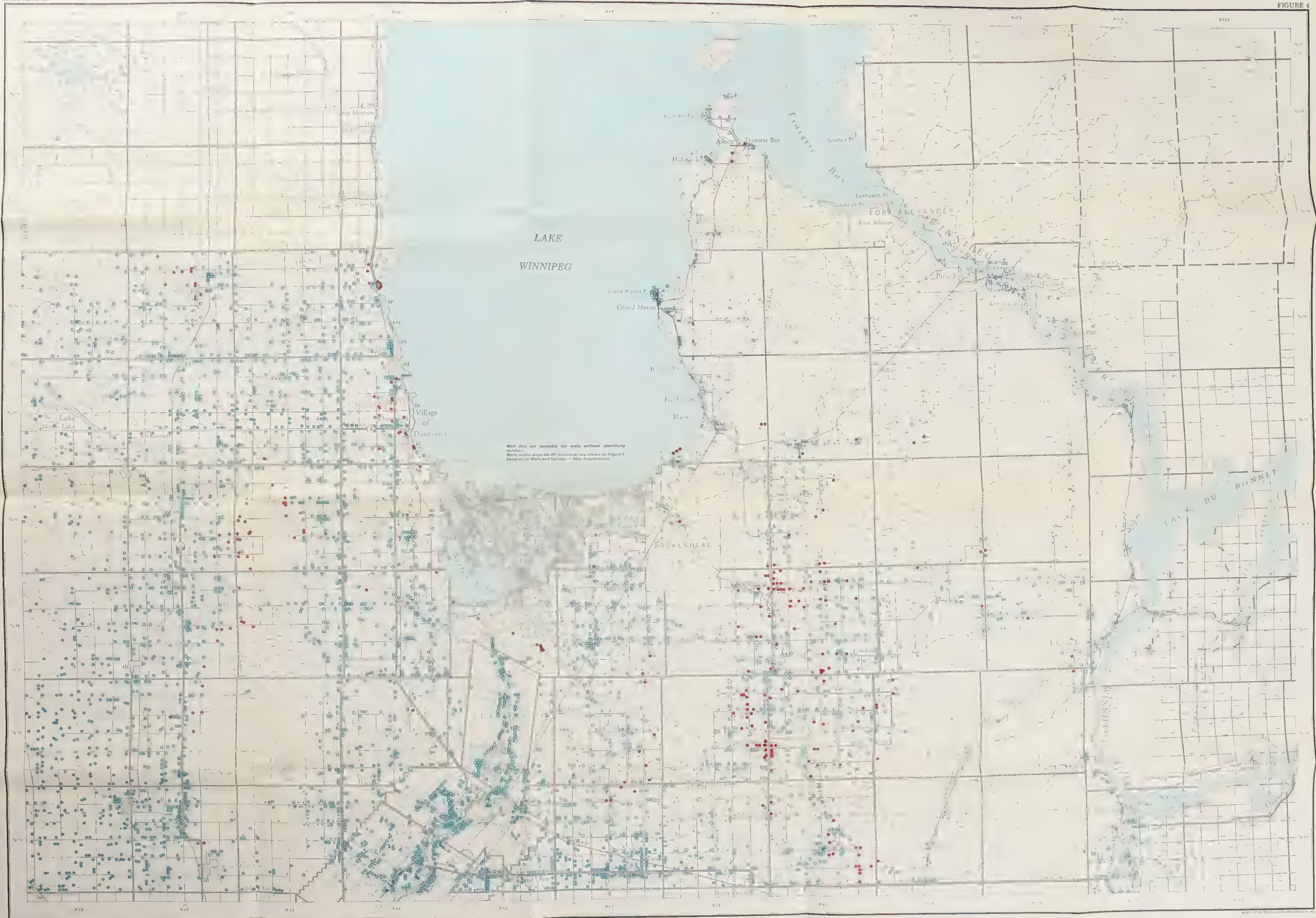
PRINTED BY THE SURVEYS AND MAPPING BRANCH,
DEPARTMENT OF ENERGY, MINES AND RESOURCES

PRODUCED BY THE INLAND WATERS BRANCH 1969

SELKIRK AREA - MANITOBA

TOPOGRAPHICAL HIGH POINTS,
FLOWING WELLS AND SPRINGS







SEMI-LOGARITHMIC DIAGRAMS

CATEGORY I

GROUPS 1-3

FIGURES 14-18

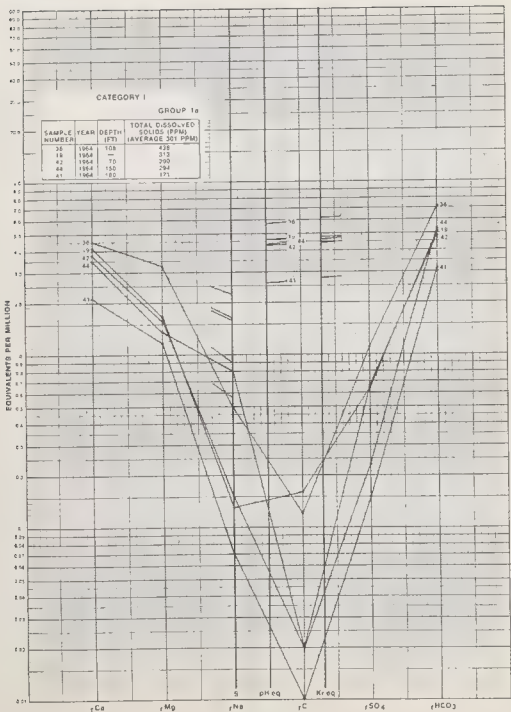


Figure 14

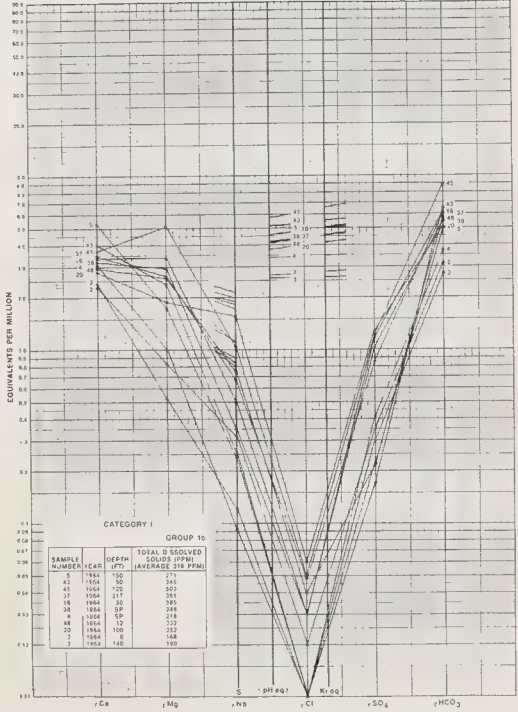


Figure 15

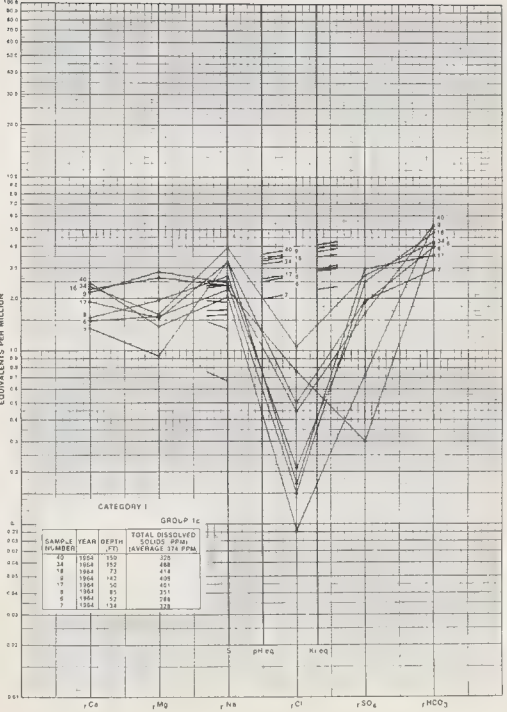


Figure 16

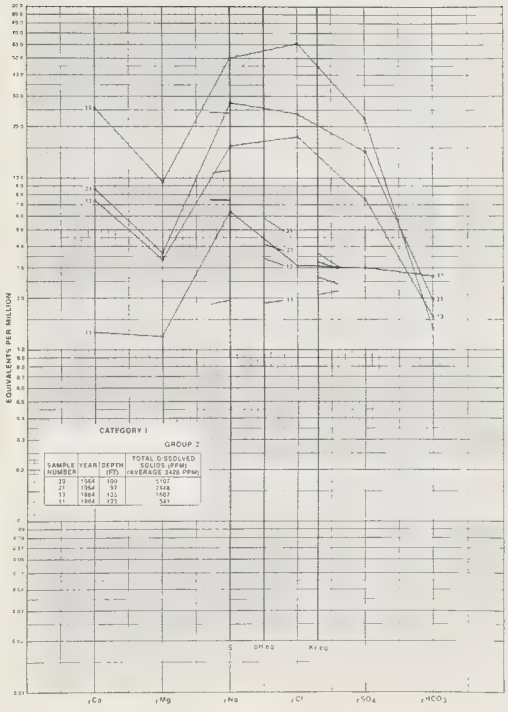


Figure 17

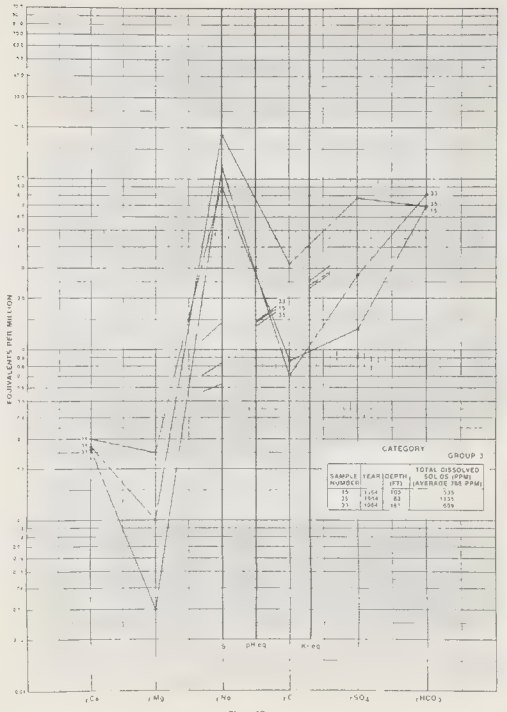


Figure 18

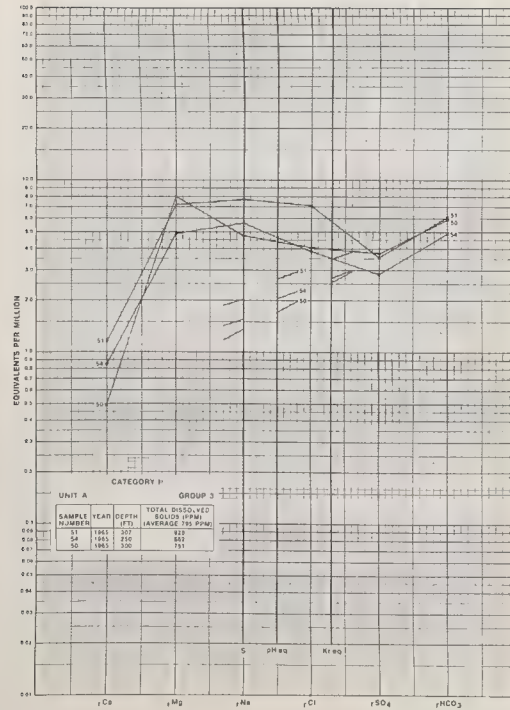


Figure 23

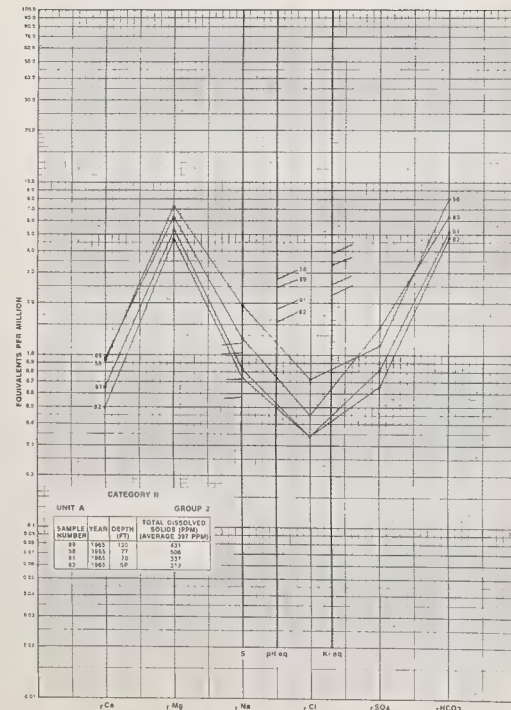


Figure 22

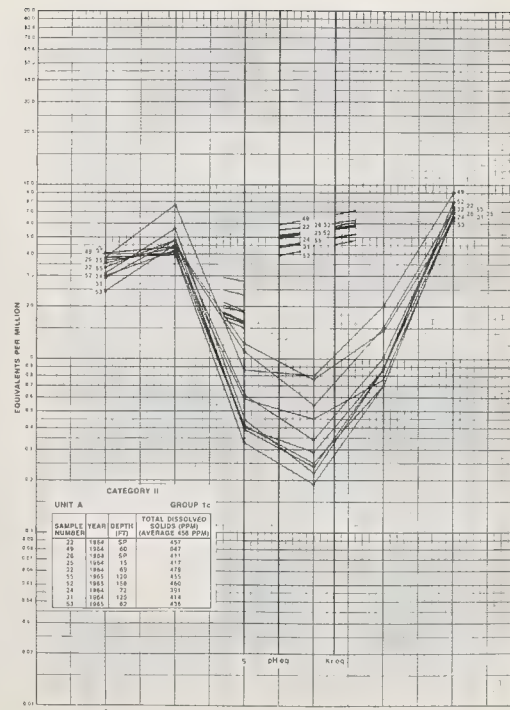


Figure 21

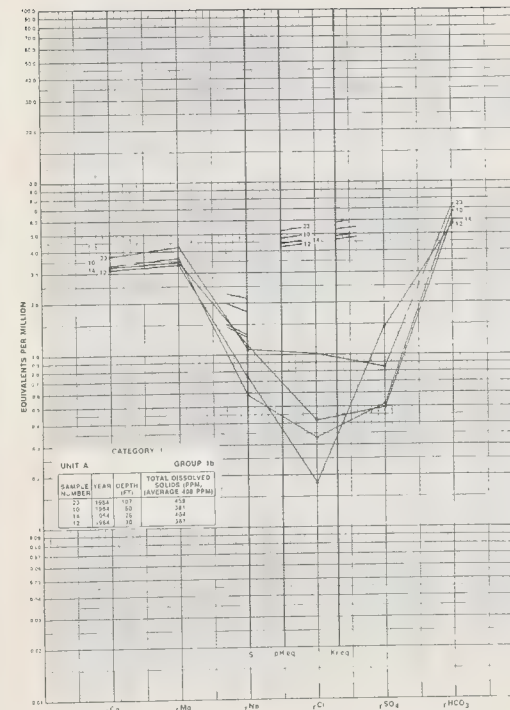


Figure 20

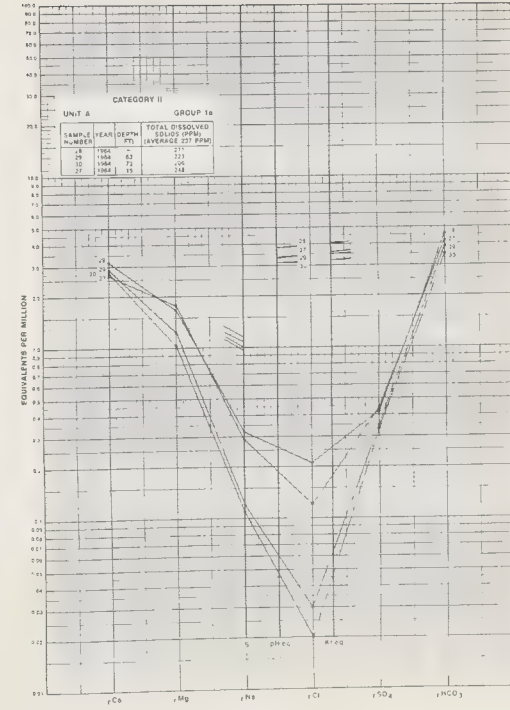


Figure 19

SEMI-LOGARITHMIC DIAGRAMS

CATEGORY II, UNIT A

GROUPS 1-8



SEMI-LOGARITHMIC DIAGRAMS

CATEGORY II, UNIT B

GROUP 1

FIGURES 30-31

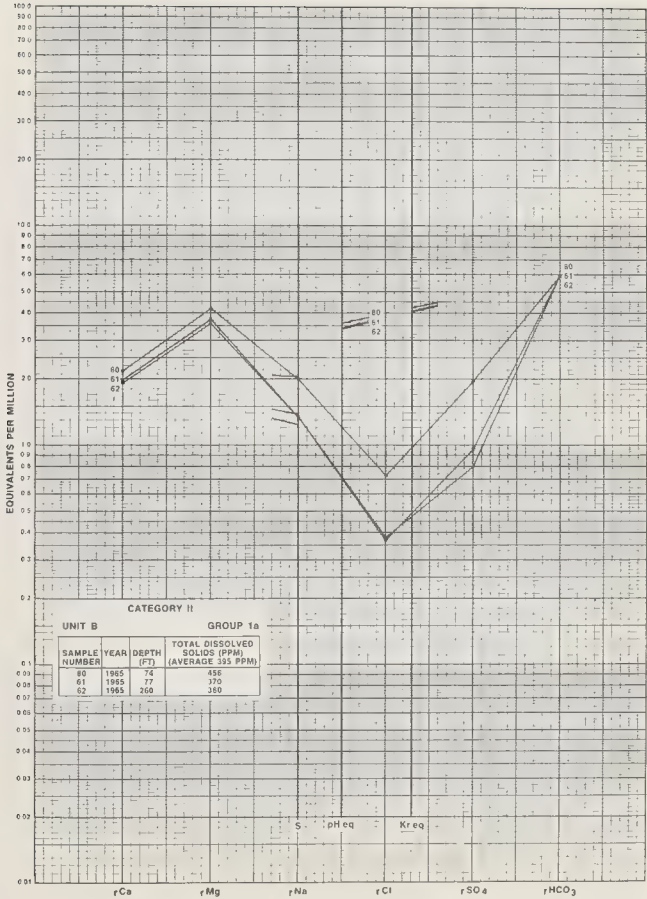


Figure 30

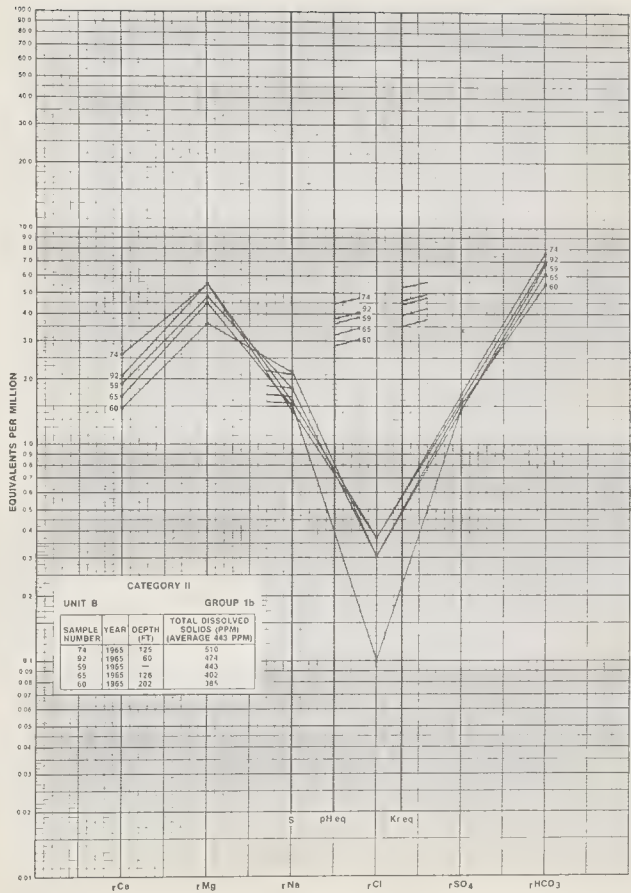


Figure 31

SEMI-LOGARITHMIC DIAGRAMS

CATEGORY III

GROUP 1

FIGURE 32

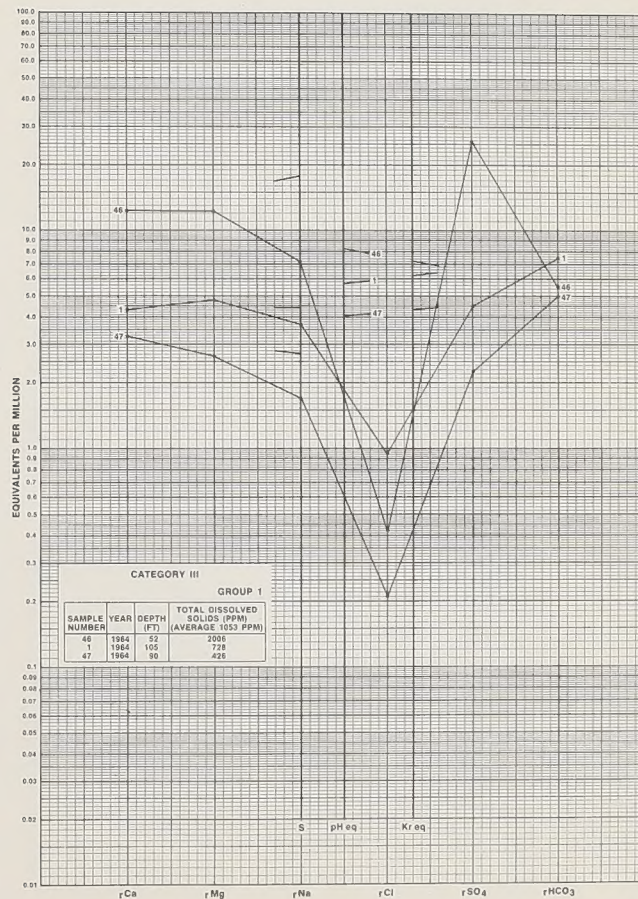
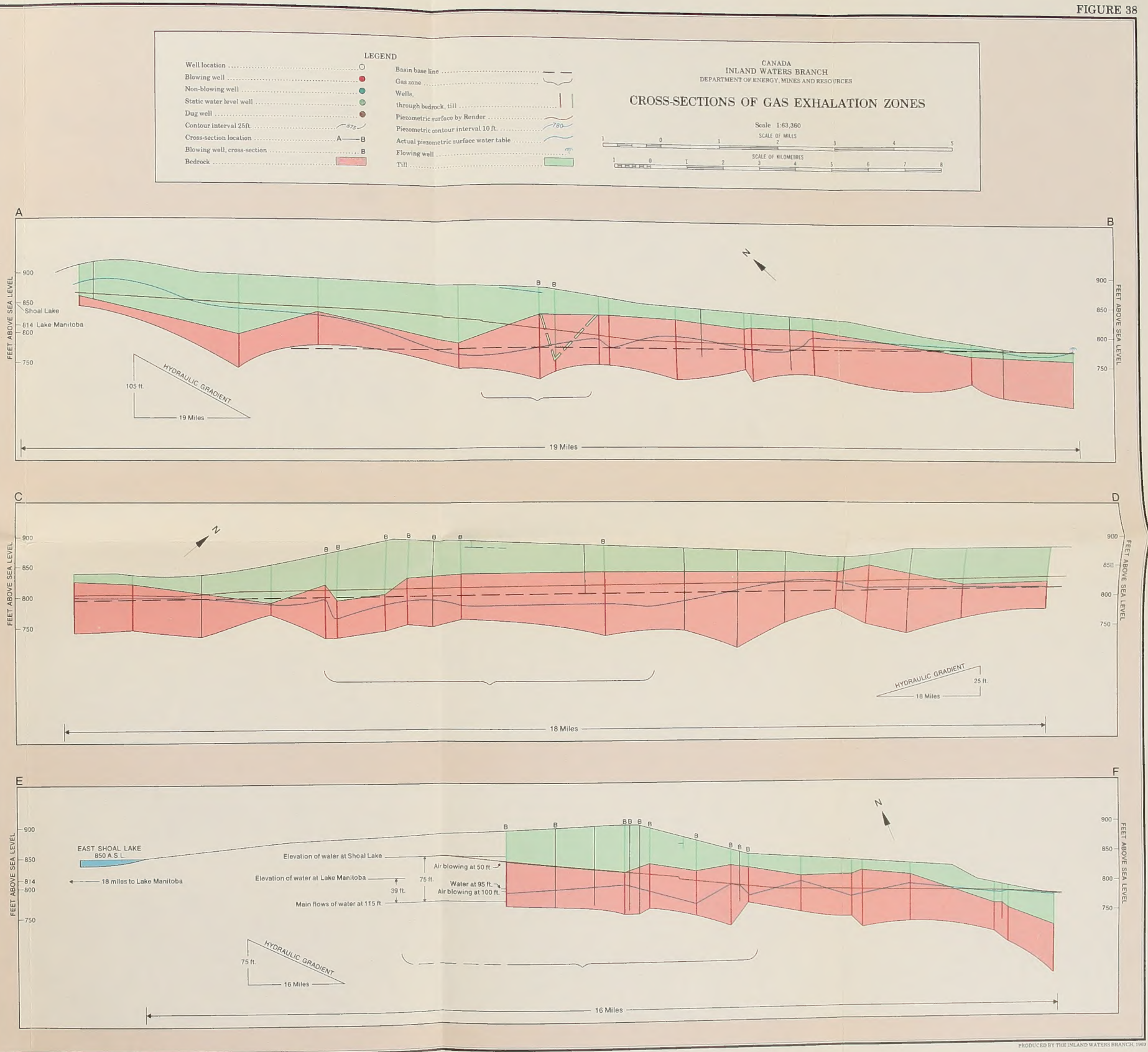
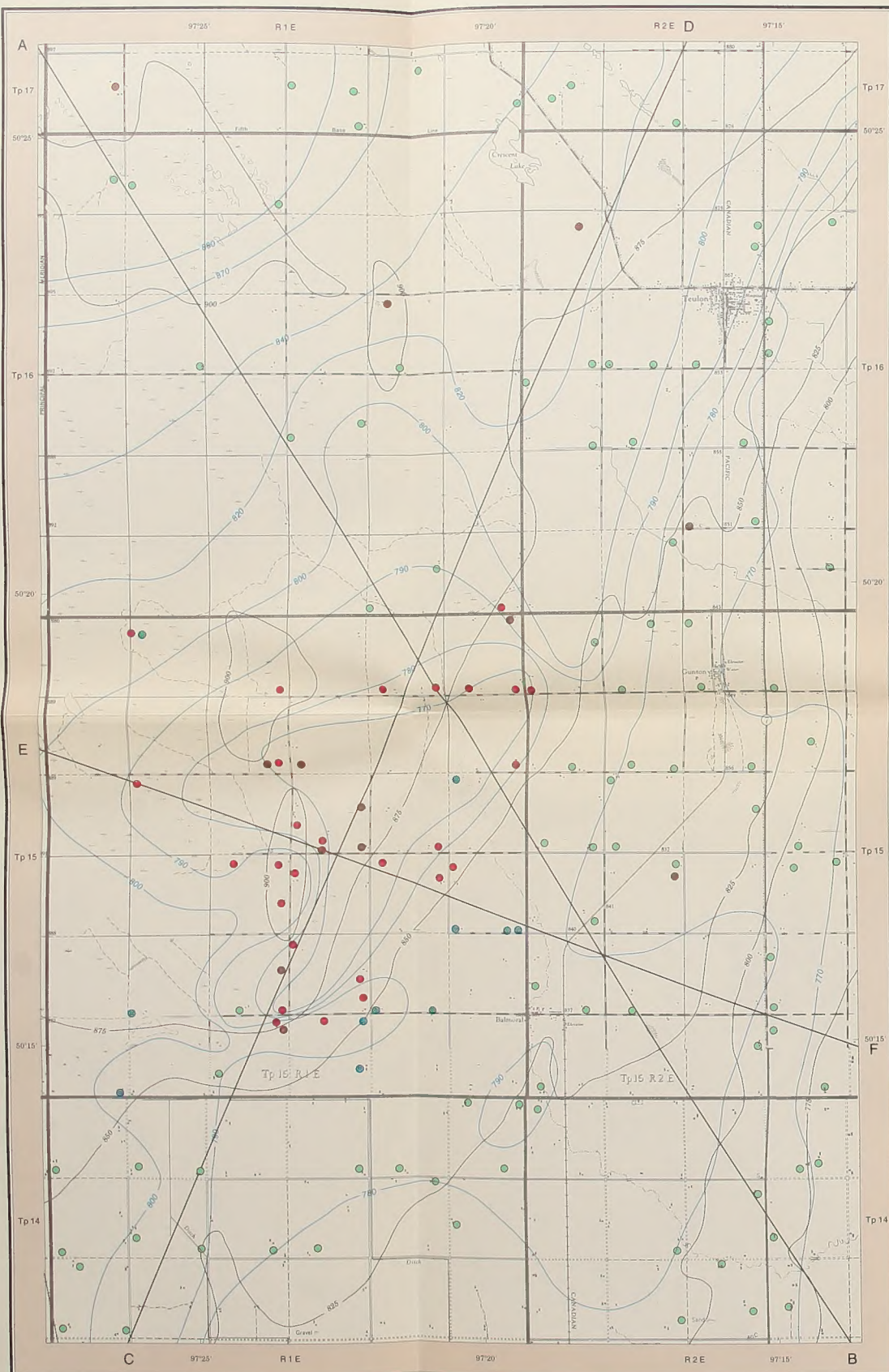


Figure 32



CA1 MT 56

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